

REMARKS

Claims 1 to 20 claims are currently pending. Claims 1-20 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner objects to the lack of definition of the term "ATO element" in the claims. Reconsideration of this rejection is respectfully requested.

Claims 1, 7 and 18 have been amended to more clearly define the "ATO element" as an "angle-to-offset element". Moreover, Applicant submits that the term "ATO element" is clearly defined in the disclosure. For example, in paragraph [0040] the term "ATO element" is specified to mean an Angle-To-Offset element that operates to deflect the propagation path of light beams within the switch core. According to the latter section of paragraph [0040], the ATO element can be provided as any suitable optical element having optical power, e.g. a mirror or a lens. Referring to Figure 3, and the corresponding discussion in paragraph [0043], it is apparent that the ATO element is an optical element that can convert the angle that a beam of light impinges it into a lateral offset of the beam of light. For example, in the last paragraph on page 5 of Canadian Patent Application No. 2,326,362, incorporated by reference into the instant application, the angle to offset transformation converts angles to offsets in the image plane. The definition of "ATO element" is further discussed in this reference. Since the definiteness of claim language must be analyzed, not in a vacuum, but in light of the content of the particular application disclosure, it is submitted that the term "ATO element" meets the requirements of 35 U.S.C. 112, second paragraph.

Accordingly, claims 1, 7, and 18, each of which defines an ATO element having optical power, are believed to be in allowable form, and thus claims 2-6, 8-17, and 19-20, which depend from claims 1, 7, and 18, respectively, are also believed to be in allowable form.

Claims 1-20 have been further rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,253,011 (Hoen). In particular, the Examiner states that Hoen discloses every aspect of the claimed invention except for the fixed mirrors, and that it would be obvious to the ordinary skilled person in the art to modify the device to include the fixed mirrors for the purpose

of having routine optical transmission paths. Reconsideration of this rejection is respectfully requested.

Applicant submits that modifying Hoen's switch to include fixed mirrors does not provide the instant invention as defined in amended claim 1 or originally filed claims 2 to 20.

With respect to claim 1 it is submitted that Hoen, and/or Hoen's switch modified to include fixed mirrors, does not teach an optical switch including *an ATO element having optical power disposed between the pair of opposed optical arrays*. Disposing the input and output ports in the optical arrays, and providing an ATO element having optical power between the pair of opposed optical arrays affords a compact optical switch (e.g. end of paragraph [0041] and paragraph [0044]) that has reduced aberrations (e.g. paragraph [0036]). Moreover, the Hoen switch does not direct the optical signals back and forth between the optical arrays a plurality of times before exiting the output ports.

With respect to claim 2, it is submitted that Hoen does not teach that the *pair of opposed optical arrays is disposed in respective focal planes of the ATO element*. This limitation allows the angle to offset transformation to occur in the image plane, as discussed above.

With respect to claim 3, it is submitted that Hoen does not teach that the *ATO element has a focal length approximately equal to a near zone length or Rayleigh range of a beam of light incident thereon*. The use of such an ATO element means that the size, i.e., the cross-sectional area of a beam switched through the core is substantially the same at both tiltable deflectors arrays and at the input/output collimators, as discussed in paragraph [0041].

With respect to claim 6, it is submitted that Hoen does not teach a pair of opposed optical arrays, wherein each optical array includes *a fixed mirror and a plurality of independently tiltable mirrors*, and wherein, *the fixed mirror of each of the pair of opposed optical arrays is positioned along the optical axis of the ATO element*.

With respect to claim 7 it is submitted that Hoen, and/or Hoen's switch modified to include fixed mirrors, does not teach an optical switch including *an ATO element having optical power for*

performing an angle-to-offset transformation. Providing an ATO element having optical power for performing an angle-to-offset transformation has the unforeseen advantage of affording a compact and low loss optical switch (e.g. as discussed in paragraph [0013]).

With respect to claim 8, it is submitted that Hoen does not teach that the *ATO element has a focal length approximately equal to a near zone length or Rayleigh range of a beam of light incident thereon.* The use of such an ATO element means that the size, i.e., the cross-sectional area of a beam switched through the core is substantially the same at both tiltable deflectors arrays and at the input/output collimators, as discussed in paragraph [0041].

With respect to claim 10, it submitted that Hoen does not teach that *a beam of light will pass five times through the ATO element.* Such a scheme allows the ATO lens to fulfill the function of a first telecentric relay, switching, and a second telecentric relay, as discussed at the end of paragraph [0043].

With respect to claims 14 and 15, it is submitted that Hoen does not teach that the *ATO element is one of a focusing lens and a GRIN lens,* or a quarter pitch GRIN lens. While Hoen does provide for the use of GRIN lenses (see Table 1), these lenses form part of the collimator array(s) and are not designed to perform an angle-to-offset transformation as defined in claims 7 and 14. Providing a switch that includes a focusing lens, such as a quarter pitch GRIN lens, disposed such that first and second arrays of deflectors are disposed in respective focal planes of the lens, provides the unforeseen advantage of a more compact switch (e.g. as discussed in paragraph [0013]).

With respect to claim 18, it is submitted that Hoen, and/or Hoen's switch modified to include fixed mirrors, does not teach an optical switch having an ATO element and first and second arrays of deflectors, wherein the *switching is performed along an optical path including the first and second arrays and the ATO element, and wherein the beam of light passes five times through the ATO element.* Such a scheme advantageously allows the ATO lens to fulfill the function of a first telecentric relay, switching, and a second telecentric relay, as discussed at the end of paragraph [0043].

Accordingly, it is submitted that claims 1, 7, and 18 are in allowable form, and claims 2-6, 9-17, and 19-20, which depend from claims 1, 7, and 18, respectively, are also in allowable form.

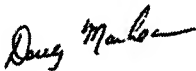
It is further submitted that the instant application currently names a sole inventor, namely, Thomas Ducellier.

Applicant sincerely believes that the above Response places this case in condition of allowance, and a holding to this effect is respectfully solicited. If, however, the Examiner believes that any issues remain, she is sincerely requested to call the applicant's undersigned attorney of record so that a brief interview may be arranged for resolving any such remaining issues.

The Commissioner is hereby authorized to charge any fees, which may be required, or credit any over-payment to Deposit Account No: 50-1465.

Please associate this application with **Customer Number 24949.**

Respectfully,



Doug MacLean
Regn No: 48,096

Customer No: 24949

Teitelbaum & MacLean
Registered Patent Agents Limited
1187 Bank Street, Suite 201
Ottawa, Ontario
Canada
K1S 3X7

Tel: (613) 523 3784
Fax: (613) 523 6799
Email: doug.maclean@jdsu.com
Email: doug@patents.org
Website: www.patents.org